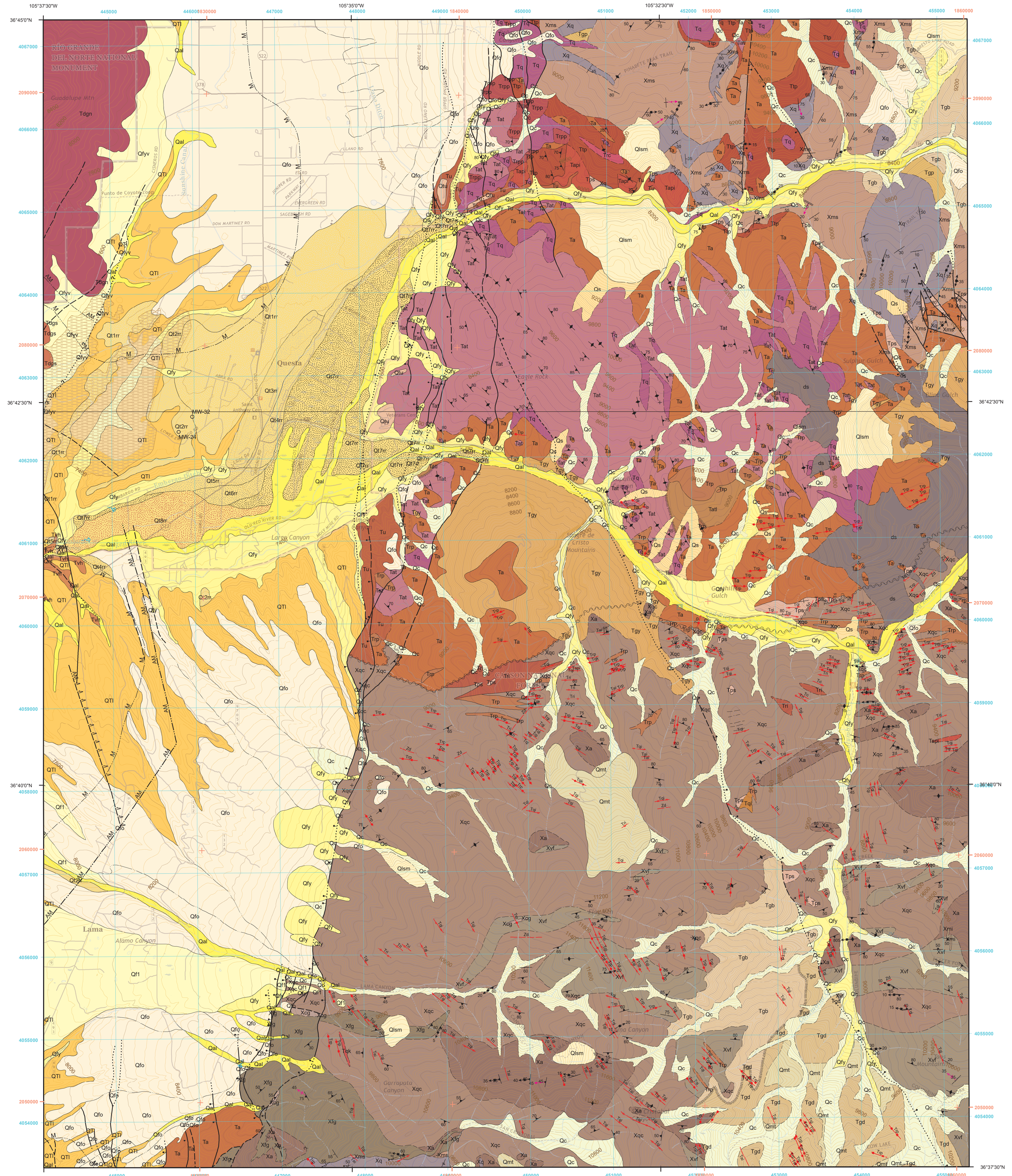
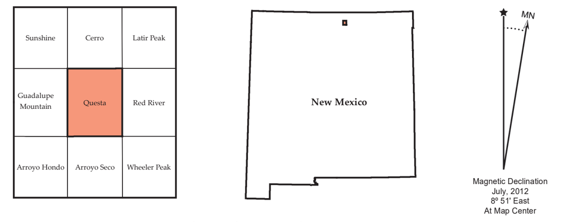


Base map from U.S. Geological Survey 2020.
North American Datum of 1983 (NAD83)
Projection and 1,000-meter grid: Universal Transverse Mercator, Zone 13S, shown in blue.
10,000-foot ticks: New Mexico Coordinate System of 1983 (central zone), shown in red.

Roads.......... U.S. Census Bureau, 2016
Roads within US Forest Service Lands....FSTopo Data with limited FS updates, 2013-2016
Names..........GNIS, 1980-2016
Hydrography..........National Hydrography Dataset, 2004
Contours..........IFSAR 4.5 m Digital Terrain Model, 2008
Wetlands..........FWS National Wetlands Inventory 2009



Quadrangle Location

New Mexico Bureau of Geology and Mineral Resources
New Mexico Tech
801 Leroy Place
Socorro, New Mexico
87801-4796

[575] 835-5490

This and other STATEMAP quadrangles are available for free download in both PDF and ArcGIS formats at:

http://geoinfo.nmt.edu

Digital layout and cartography by the NMBGMR Map Production Group:
Phil L. Miller, Amy L. Dunn, Ann D. Knight, and Justine L. Nicolette

1:24,000

Contour Interval 40 Feet

North American Vertical Datum of 1988

New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 247

Mapping of this quadrangle was funded by a matching-funds grant from the STATEMAP program of the National Cooperative Geologic Mapping Act, administered by the U. S. Geological Survey, and by the New Mexico Bureau of Geology and Mineral Resources, (Dr. Nelia W. Dunbar, *Director and State Geologist*; Dr. J. Michael Timmons, *Assoc. Director for Mapping Programs*).

Geologic Map of the Questa 7.5-Minute Quadrangle, Taos County, New Mexico

June 2012

by
Keith I. Kelson[1], Paul W. Bauer[2], and Ren A. Thompson[3]

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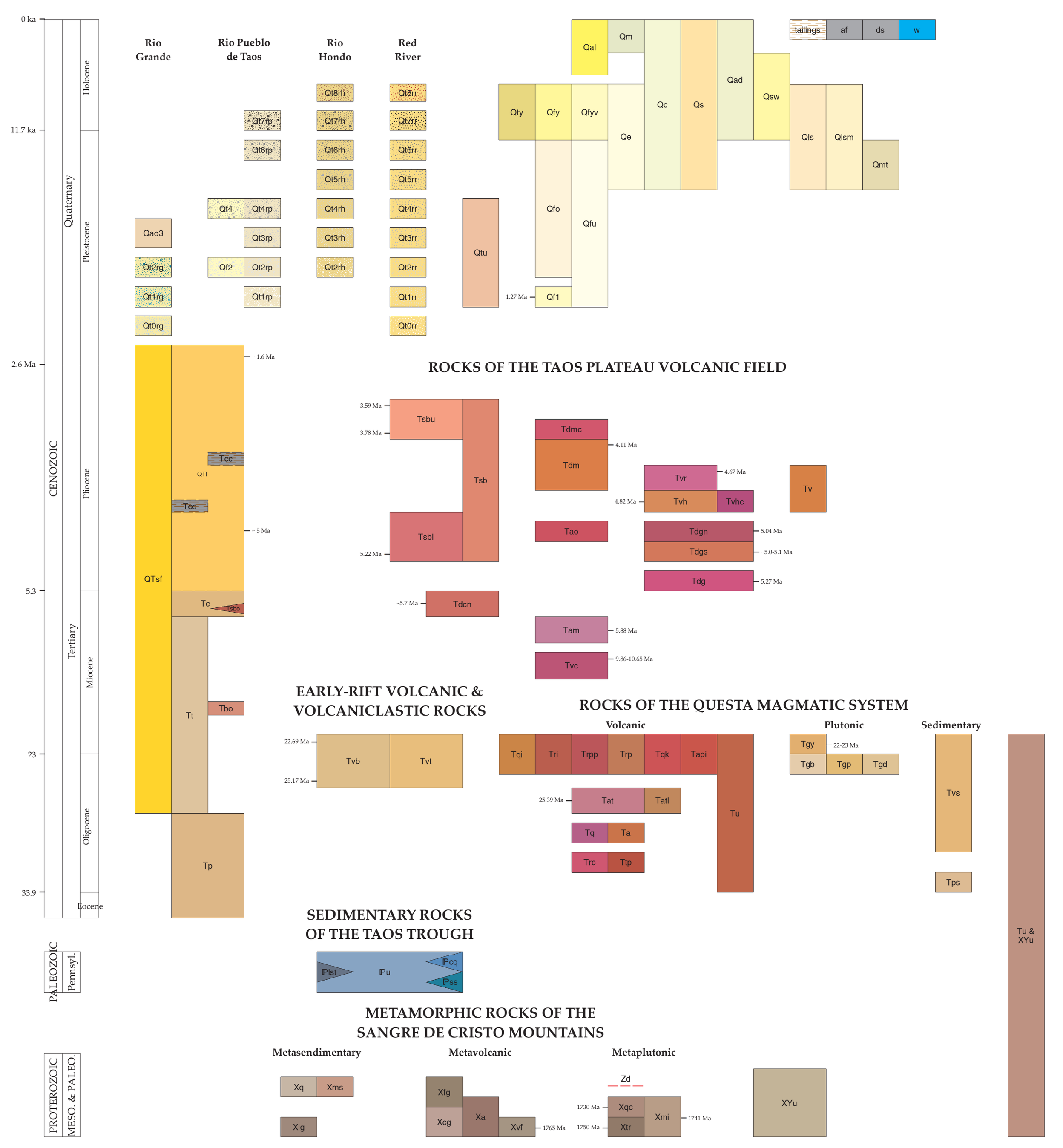
Comments to Map Users

A geologic map displays information on the distribution, nature, orientation, and age relationships of rock and deposits and the occurrence of structural features. Geologic and fault contacts are irregular surfaces that form boundaries between different types or ages of units. Data depicted on this geologic quadrangle map may be based on any of the following: reconnaissance field geologic mapping, compilation of published and unpublished work, and photogeologic interpretation. Locations of contacts are not surveyed, but are plotted by interpretation of the position of a given contact onto a topographic base map; therefore, the accuracy of contact locations depends on the scale of mapping and the interpretation of the geologist(s). Any enlargement of this map could cause misunderstanding in the detail of mapping and may result in erroneous interpretations. Site-specific conditions should be verified by detailed surface mapping or subsurface exploration. Topographic and cultural changes may not be shown due to recent development.

Cross sections are constructed based upon the interpretations of the author made from geologic mapping and available geophysical and subsurface (drillhole) data. Cross sections should be used as an aid to understanding the general geologic framework of the map area, and not be the sole source of information for use in locating or designing wells, buildings, roads, or other man-made structures.

The New Mexico Bureau of Geology and Mineral Resources created the Open-file Geologic Map Series to expedite dissemination of these geologic maps and map data to the public as rapidly as possible while allowing for map revision as geologists continued to work in map areas. Each map sheet carries the original date of publication below the map as well as the latest revision date in the upper right corner. In most cases, the original date of publication coincides with the date of the map product delivered to the National Cooperative Geologic Mapping Program (NCGMP) as part of New Mexico's STATEMAP agreement. While maps are produced, maintained, and updated in an ArcGIS geodatabase, at the time of the STATEMAP deliverable, each map goes through cartographic production and internal review prior to uploading to the Internet. Even if additional updates are carried out on the ArcGIS map data files, citations to these maps should reflect this original publication date and the original authors listed. The views and conclusions contained in these map documents are those of the authors and should not be interpreted as

Correlation of Map Units (contains units in the San Luis Basin)



Explanation of Map

Description of Map Units (contains all units for the San Luis

Alluvial-fan deposits (middle Pleistocene)—Alluvial-fan ... poorly sorted silt, sand, pebbles, and boulders; stage III to IV ... though soil horizons are commonly affected by surface erosion; ... the clasts are principally granitic, intermediate volcanic, basalt, ... clasts are also present east of Arroyo del Alamo; in the Taos ... granitic and metamorphic rock types; the deposit is finer grained ... Luris Mountains range front; Qf1 is differentiated from QTl by ... oxidation, poor sorting, absence of abundant manganese oxide ... weathered; slope of Qf1 surface on the Taos and Los Cordovas ... is dissected by numerous southwesterly trending arroyos; on ... tive with Unit Q1p of Kelson (1986); a tephra within Qf1

02-24-00-00-00—heading02—Terrace Depostis of the Red River—Terrace Depostis of the Red River (Cenozoic)—Terrace Depostis of the Red River

02-24-01-00-00—map unit—Qt8rr—Stream terrace deposits of the Red River (middle to late Holocene)—Stream terrace deposits of the Red River (middle to late Holocene)—Poorly sorted silt, sand, pebbles, cobbles, and boulders; clasts primarily of quartzite, schist, granite, and volcanic rock types; deposits have negligible soil development; typically present as thin (< 5 m) alluvial deposit beneath high-stage floodplain or adjacent to active alluvial channels; equivalent to Qt8 of Kelson (1986) and Pazzaglia (1989).

02-24-02-00-00—map unit—Qt7rr—Stream terrace deposits of the Red River (early to middle Holocene)—Stream terrace deposits of the Red River (early to middle Holocene)—Poorly sorted ...

03-01-00-00-00—map unit—Tsb—Servilleta Basalt (Pliocene)—Servilleta Basalt (Pliocene)—Flows of dark-gray tholeiitic basalt characterized by small olivine and tabular plagioclase phenocrysts, diktytaxitic texture, and local vesicle pipes and segregation veins; forms thin, fluid, widespread pahoehoe basalt flows of the Taos Plateau volcanic field erupted principally from large shield volcanoes in the central part of the Taos Plateau (Lipman and Mehnert, 1979) but also from several small shields and vents to the northwest of the map area near the Colorado border (Thompson and Machette, 1989; K. Turner, personal comm., 2014); additional buried vents west of the Rio Grande likely exist; flows typically form columnar-jointed cliffs where exposed, with a maximum thickness of approximately 50 m in the Rio Grande gorge 16 km northwest of Taos; Tsb can locally be subdivided into the lower Servilleta Basalt (Tsbl), the middle Servilleta Basalt (Tsbm), and the upper Servilleta Basalt (Tsbu) that are separated by sedimentary intervals as much as 70 m thick in ...

03-15-00-00-00—map unit—Tam—Andesite of Cerro Montoso (Miocene)—Andesite of Cerro Montoso (Miocene)—Dark gray to black, porphyritic, olivine andesite (57.6 wt% SiO_2, 8 wt% Na_2O+K_2O) lava flows erupted from vents on Cerro Montoso, one of the largest, petrologically uniform, shield volcanoes of the Taos Plateau volcanic field (Lipman and Mehnert, 1979); contains 2-3% phenocrysts of olivine in a microcrystalline groundmass of plagioclase, olivine, augite, and Fe-Ti oxides; the lower slopes of Cerro Montoso in the western map area are commonly mantled in colluvium, and rarely preserve well-developed flow morphology; instead outcrops typically exhibit blocky flow tops and remnants of many discontinuous and aerially restricted flow lobes; Appelt (1998) reported an 40Ar/39Ar age of 5.88 ± 0.18 Ma for a groundmass separate from the west side of Cerro Montoso.

05-02-02-00-00—map unit—Tgb—Biotite granite (Oligocene)—Biotite granite (Oligocene)—Granitic roof phase of the Rio Hondo pluton emplaced in the Questa caldera at about 26 Ma, during volcanism and caldera formation; medium-grained and equigranular, with sparse aplite and no hornblende (Lipman and Read, 1989).

05-02-03-00-00—map unit—Tgp—Granite porphyry (Oligocene)—Granite porphyry (Oligocene)—Fine-grained porphyritic biotite granite and aplite, texturally transitional between mapped bodies of granite (Tgb) and intrusive porphyritic rhyolite (Trp) or rhyolite (Tri), especially in the Rito del Medio and Canada Pinabete areas (Lipman and Read, 1989).

05-02-04-00-00—map unit—Tgd—Rio Hondo pluton (Oligocene)—Rio Hondo pluton (Oligocene)—White to pale, grayish-orange, medium- to fine- grained, massive to locally foliated ...

Geologic Cross Section A–A'

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